Characterization of TI-LGADs
April TB analysis Run 607
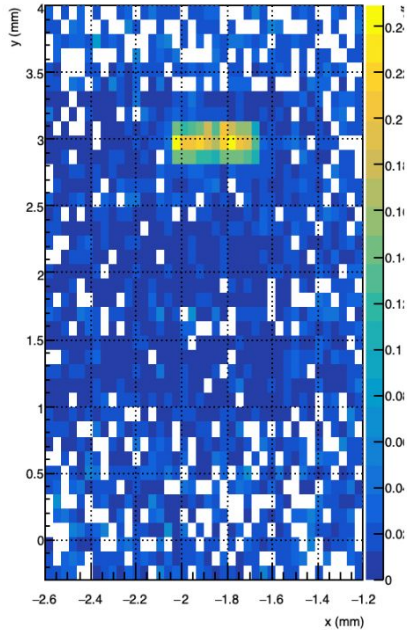
Iskra Velkovska

HGTD Meeting, 09.01.2026

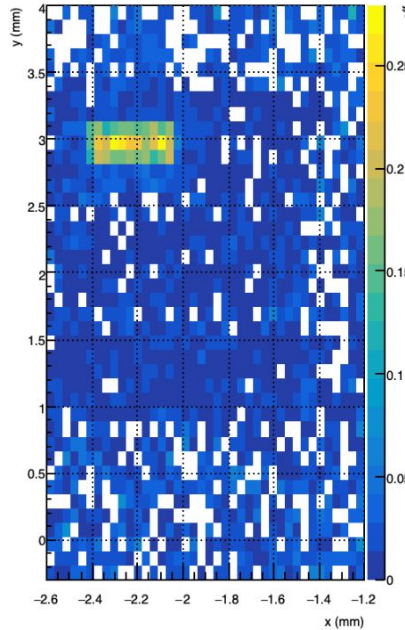**Jožef Stefan Institute Ljubljana, Slovenia**

Run number 607, -23.83 C, with one reconstructed track
Non-irradiated DUT, V2-TR1-TW2/TW3 biased @165 V

- **Waveforms entries: 276813**
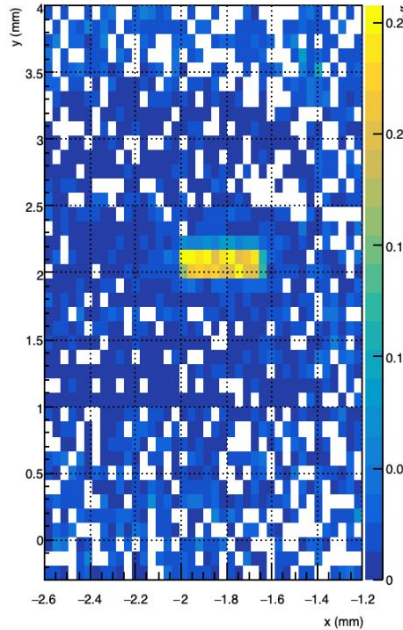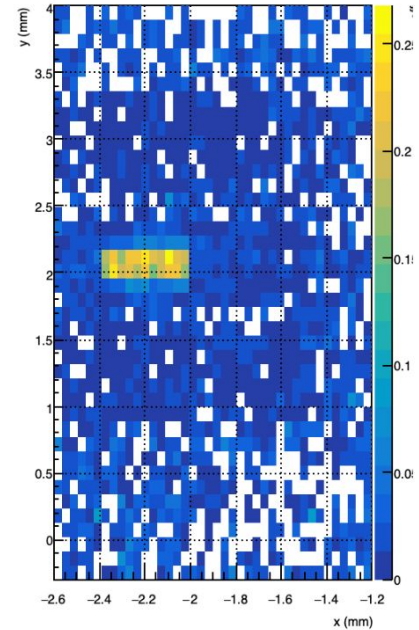- **Number of channels (metadata): 12**

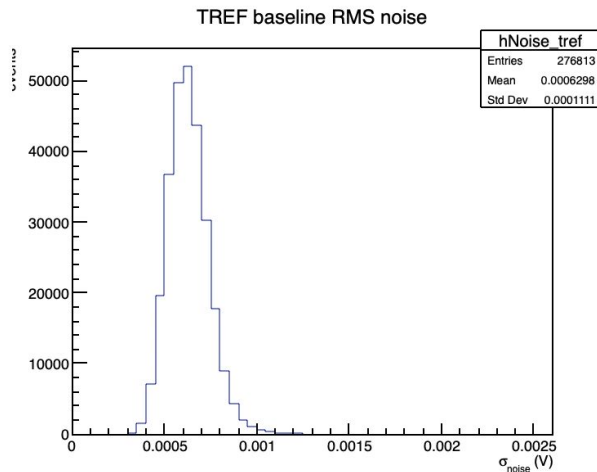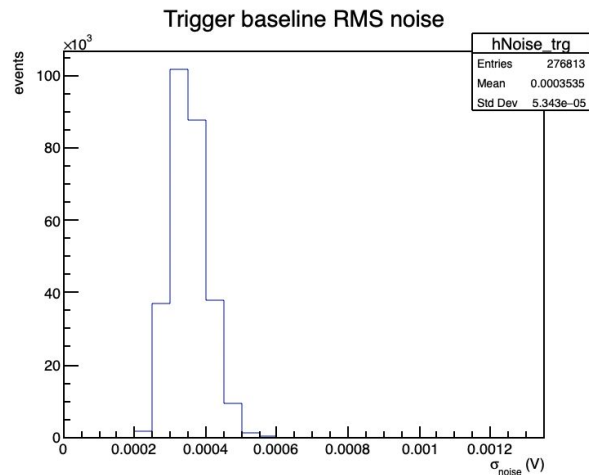Efficiency (wf 0, CAEN ch 1) Efficiency (wf 1, CAEN ch 2) Efficiency (wf 2, CAEN ch 9) Efficiency (wf 3, CAEN ch 10)
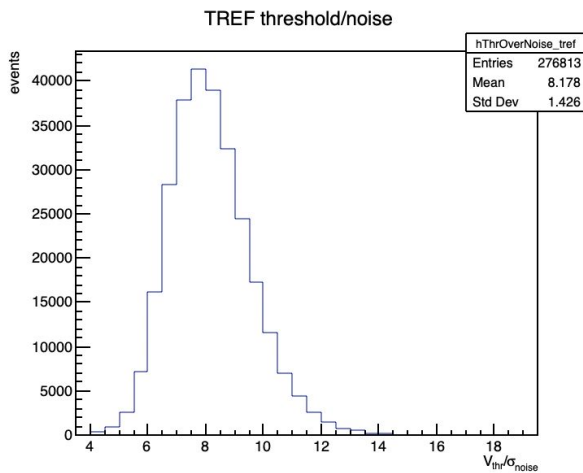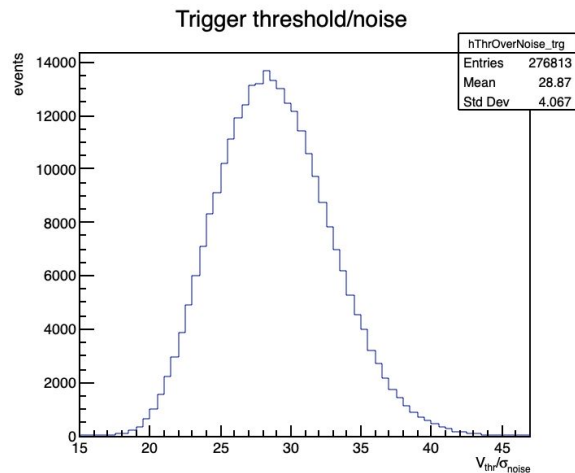
Trigger threshold-to-noise ratio

- Mean ≈ 29
- Threshold ≈ 30 σ above noise

TREF threshold-to-noise ratio

- Mean ≈ 8
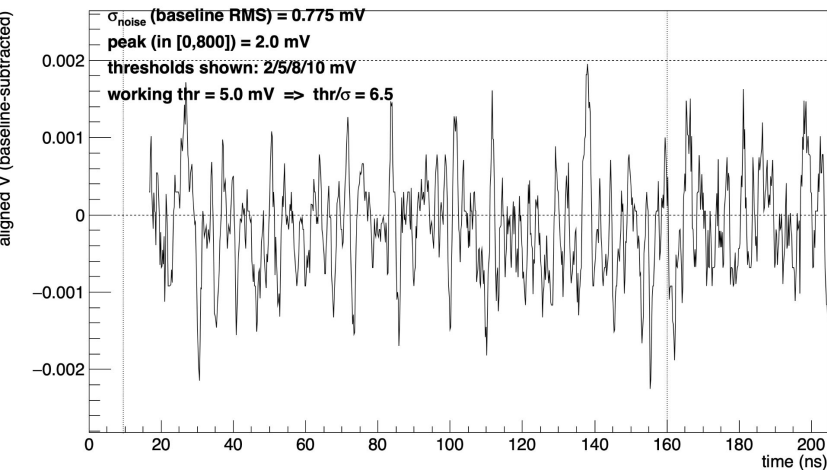- Threshold ≈ 8 σ above noise

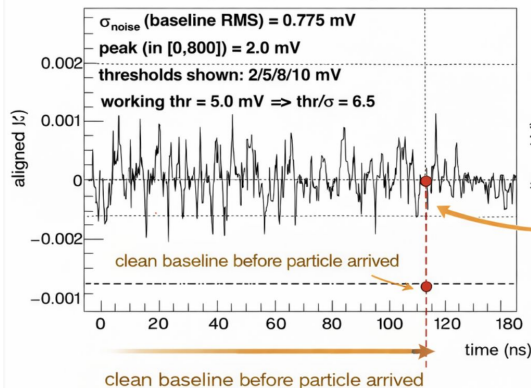**Thresholds: trig=10 mV, tref= 5 mV**

- Selection of a time window for integrating -> leading edge of TREF and trigger
- Integration window relative to that time
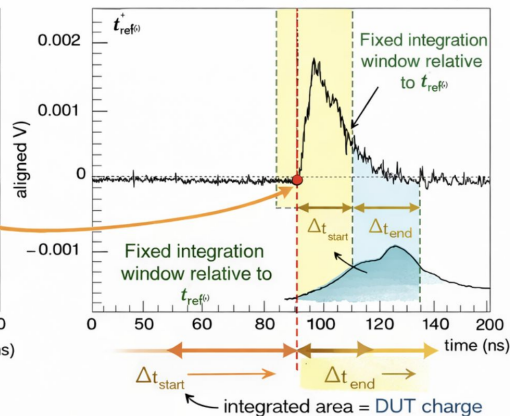

TREF noise-only baseline (event 4, iwf 9)

$t_{ref(\cdot)}^{+} \rightarrow$ align integration window $\longrightarrow$ integrat'e signal
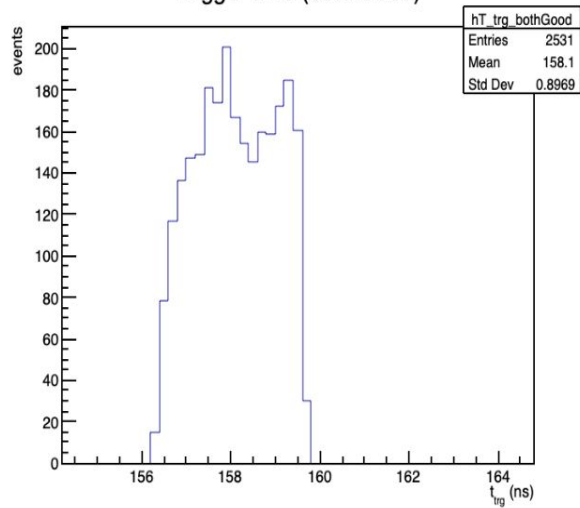
Noise-only TREF baseline (event 4, iwf 9)
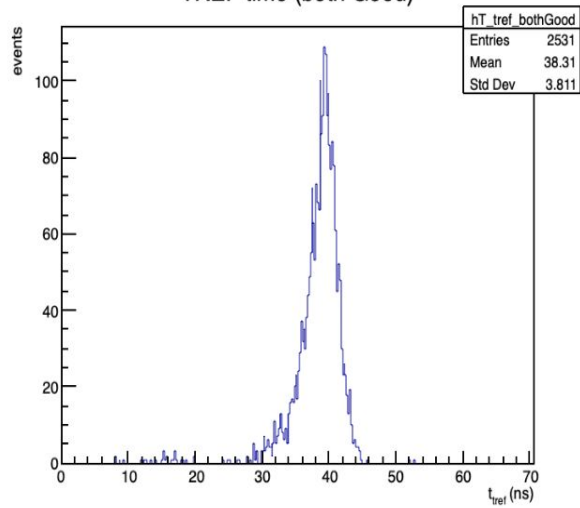
TREF typical pulse (event 416, iwf 9)

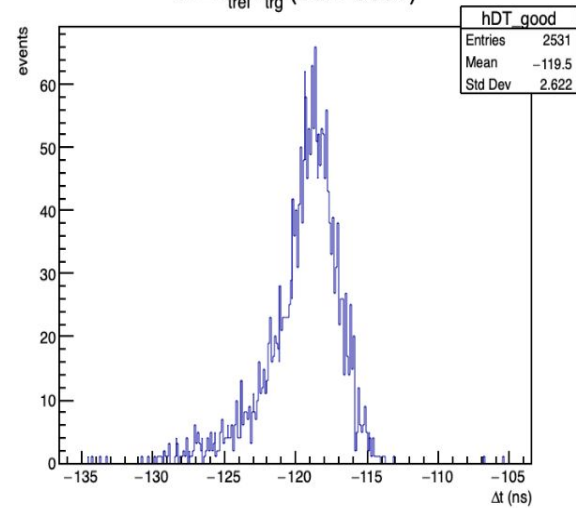$t_{ref(\cdot)}^{+} \longrightarrow$ align integration window $\longrightarrow$ integrate signal

Trigger time (both Good)

hT_trg_bothGood	
Entries	2531
Mean	158.1
Std Dev	0.8969

TREF time (both Good)

hT_tref_bothGood	
Entries	2531
Mean	38.31
Std Dev	3.811

$\Delta t = t_{tref} - t_{trg}$ **(both Good)**

hDT_good	
Entries	2531
Mean	−119.5
Std Dev	2.622

TREF peak (aligned)

Trigger peak (aligned)
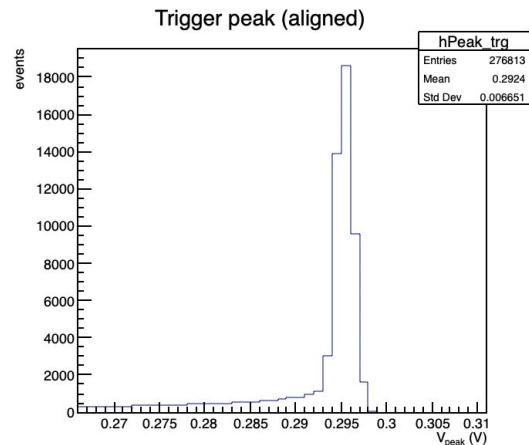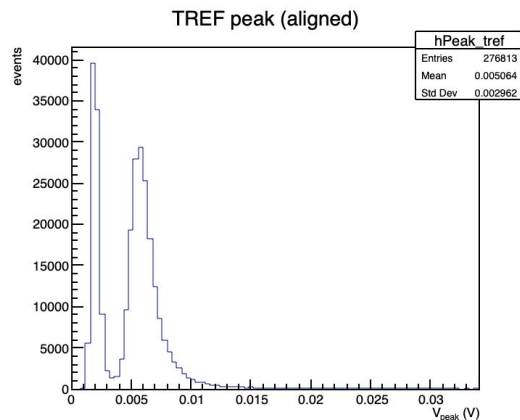
The fraction of the pulse height at which I take the timing

Trigger threshold/peak

TREF threshold/peak

timing near the top of the pulse
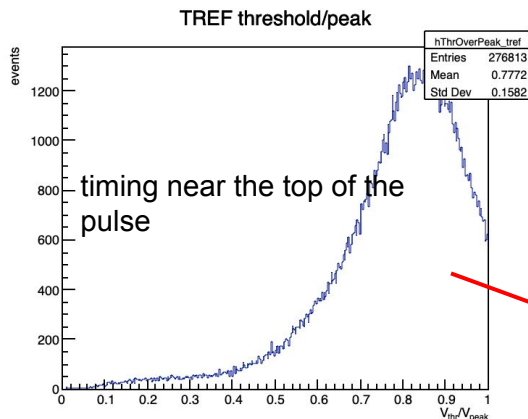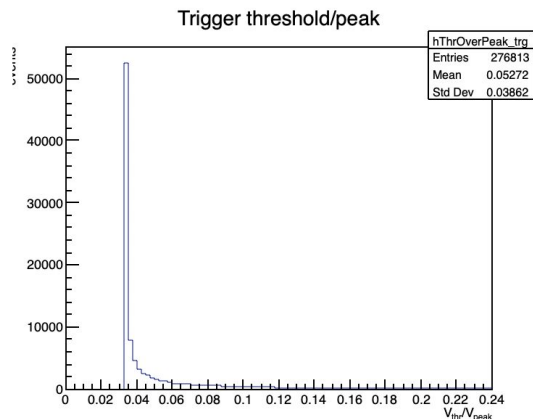
The trigger pulse amplitude is around 300 mV, but the timing threshold is set at 10 mV, corresponding to about 3–5% of the pulse height.

Timing is therefore extracted on the very steep part of the leading edge, which minimizes time jitter.

For TREF, the threshold is set close to the pulse maximum to suppress noise-induced crossings for small signals